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ABSTRACT

The Career Planning System (CPS), a highly structured microcomputer package designed to provide middle school age mildly handicapped students with individualized career exploration and career planning experiences, is described. Development of the system's three components (30 floppy disks, a student guide, and an instructor guide) and field testing with learning disabled, mildly retarded, and severely behavior disordered students are traced. The system is explained to draw on the student's own interests and is pointed toward four major career development outcomes: learning about personal interests, examining occupations, identifying activities in which personal interests may be nurtured, and relating educational preparation to potential occupational choices. Ten interest areas are presented (representative occupations in parentheses): advising (child care attendant, lawyer); arranging (architect, hair stylist); building and making (roofing, painter); doing clerical work (cashier, file clerk); helping (police officer, waiter); maintaining and repairing (mechanic, plumber); thinking in pictures (cartoonist, photographer); using environmental information (farmer, landscape gardener); working with equipment (cook, telephone operator); and working with numbers and symbols (library assistant, teller). Step by step progression through the CPS is described in which students investigate activities and "interview" workers. An education plan provision of the system allows student and teacher to plan for future learning in the occupation of interest. A management component that enables the teacher to monitor the individualized lessons is described..(CL)

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CAREER PLANNING MEETS THE MICRO: A DEMONSTRATION

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A Paper Presented at the Council for Exceptional
Children's National Conference on the Use
of Microcomputers in Special Education

Hartford, Connecticut
March 10-12, 1983

The Career Planning System (CPS), Microcomputer Version, is a comprehensive, highly structured instructional package designed to provide individualized career-exploration and career-planning experiences for mildly handicapped students of approximately middle-school age. Developed specifically to take advantage of the motivational, managerial, and interactive capabilities of the Atari 800 microcomputer system (console, monitor, and two disk drives) with 48K of memory, the CPS is intended to serve students with mild mental retardation, learning disabilities, and severe behavior handicaps who are capable of reading at the 3.5 grade level. Field tested with such students at five school districts within or adjacent to major population centers in Colorado, Missouri, New York, Ohio, and Texas, the CPS has been found to engender a significant increase (at the .05 level) in students' overall knowledge about careers, about themselves with respect to careers and career planning, and about career planning in general.

A combined staff of instructional designers and computer programmers at the National Center for Research in Vocational Education, The Ohio State University, worked under an eighteen-month grant from the U.S. Department of Education to develop, test, and revise the CPS materials and to initiate a plan for their dissemination. The final instructional package prepared through this effort consists of three components:

- Thirty floppy disks--the core of the CPS--that provide (1) an interactive instructional component that is the main vehicle for student progress through the

forty occupations represented in the CPS and (2) a comprehensive management system with a variety of instructor options for monitoring student progress throughout the instructional materials;

- A Student Guide for each student that provides reinforcement for student learning, a permanent record of the student's experiences with the CPS, and a means for expansion and discussion of those experiences; and
- An Instructor Guide that provides the theoretical, technical, and instructional information a teacher or counselor needs to implement the CPS.

Arrangements are currently underway to have the materials marketed and distributed by a commercial agency. At present, it is assumed that the complete package will be available in the Fall of 1983. The National Center's Program Information Office is maintaining a file of requests about availability that will be answered as soon as this information is official.

Each of the components of the CPS was developed in accordance with a set of minutely detailed specifications compiled by project staff early in the conduct of the work effort. These specifications--which cover both the computerized and the printed CPS materials as well as their interrelationships--were developed to ensure that the final materials truly meet the needs of the target population and their teachers. Thus, the specifications detail not only the content of all the pieces but the particular format of each--for example, the layout of each type of computerized display to ensure

that it presents information in a direct, consistent, and visually appealing manner that will enhance the possibilities for student learning. A particularly significant segment of the specifications deals with instructional and technical considerations related to the needs of mildly handicapped learners. This segment addresses such issues as the presentation of objectives, the appropriate development of concepts, various aspects of reading level and language style, the use of sensitive and effectively presented feedback, the provision of aids to the transfer of learning and generalization of knowledge, appropriate student-computer interaction, selected types of individualization, the use of sound and graphics, and the encouragement of learner independence.

The Instructional Materials

Through the CPS, students become acquainted with a variety of occupations that are representative of basic worker functions. The key to the System is the students' own interests--not in occupations themselves but in activities the students presently enjoy, either in school or during leisure time. The final intended outcome is students' insightful participation in planning their studies and activities for the future. This goal must, of course, be an outgrowth of development in other areas--in self-understanding; in problem-solving, decision-making, and planning skills; and in increasing knowledge of occupations, their interrelationships, and their relationship to the individual. Therefore, the CPS materials are designed to help students achieve four major career-development outcomes:

- To learn about personal interests,
- To examine occupations to learn how they may relate to personal interests,
- To identify activities and areas of study in which personal interests may be nurtured and in which related skills may be developed, and
- To relate educational preparation to potential occupational choices.

The organization of the CPS reflects the System's emphasis on these goals. As noted in Figure 1, "Career Planning System Overview" the student begins to proceed through the instructional materials at the level of personal interests and progresses through a wide variety of experiences before he or she is asked to consider various factors in relation to educational and career planning.

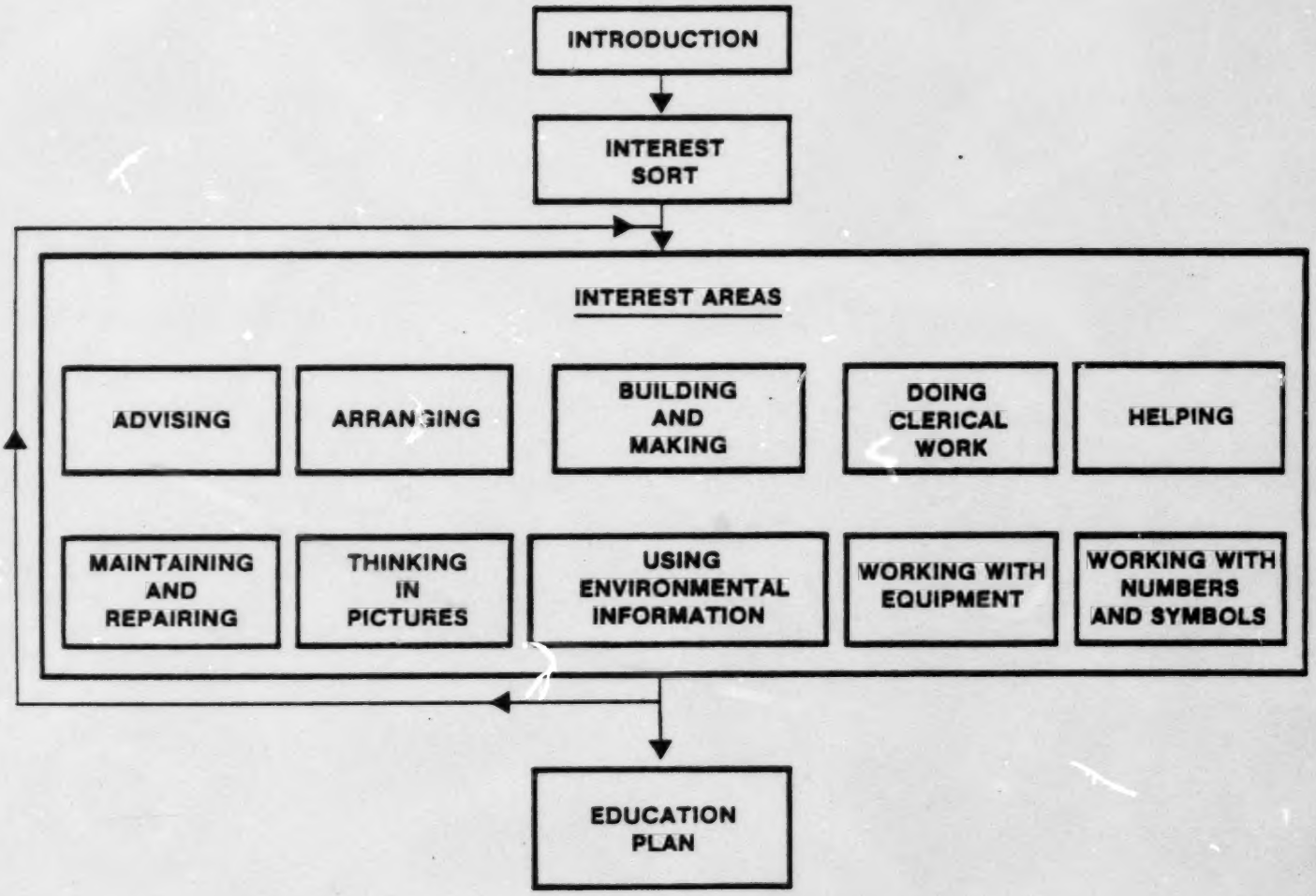
After reading in the Student Guide a brief "Welcome" statement and an illustrated list of the six steps involved in loading a disk into a disk drive, the student signs on to the computer by typing his or her first name and personal CPS code number. The student is then routed automatically through each of the System's four major components in turn--Introduction, Interest Sort, Interest Areas, and Education Plan. The Instructor Guide provides a detailed description of each of these components and of the procedures the teacher and students should follow in relation to them.

1. Introduction

The Introduction includes an explanation of the general content and structure of the CPS and of the objectives students should

FIGURE 1

CAREER PLANNING SYSTEM OVERVIEW



achieve through using it; a variety of vocabulary-building activities--for example, word-search and crossword puzzles--related to terms essential to the CPS; and general instructions on how to use the CPS. Student understanding of this information is reinforced through a series of exercises in the Student Guide designed to complement the computer based activities. The Student Guide also contains an illustrated glossary of supplementary vocabulary words about occupations ("goods," "services," etc.) and about educational preparation ("college," "apprenticeship," etc.) that students will encounter later in the CPS but will not need in the early stages. This glossary was included in the Guide to provide students access to important terms they may not know without overloading the computerized Introduction with vocabulary that will not be used for a long time.

2. Interest Sort

This key component of the System is comprised of fifty general questions related to the ten CPS Interest Areas. Designed to help students identify interests in a variety of work related environments and activities--for example, working outdoors, helping people with their problems, etc.--the Interest Sort provides the basis for each student's individualized movement through the rest of the CPS package. After the student responds A, B, or C to each statement according to his or her degree of interest in it--A. A lot, B. A little, or C. None at all--the CPS's computerized management system automatically sorts and compiles the answers into an ordered listing of the student's Interest Areas. When the student's list appears on the display, he or she is instructed to

copy the list into the Student Guide for reference. From this point on, each time the student signs on to the computer to use the CPS, he or she will be taken through the System automatically on the basis of this list.

3. Interest Areas

The ten CPS Interest Areas are the heart of the Career Planning System. Developed around general areas that middle-school students might have or wish to explore rather than selected from traditional occupational clustering systems, the Interest Areas are designed to help students deal with immediate self-knowledge rather than with abstract speculation about the future. Each Interest Area is built around four occupations chosen to cover an educational continuum from high school diploma to graduate degree; a range of skills from entry level to professional; and an array of visual, verbal, and computational abilities. Figure 2, "CPS Interest Areas and Occupations," displays the titles of the ten Interest Areas and the names of the four occupations covered in each.

Figure 3, "Interest Area Flowchart," indicates the way in which a student moves through each Interest Area that he or she elects to explore. First, the student reads a Probe--which provides a brief description of the Interest Area and presents ten statements related to the Area's activities. The student responds "yes" or "no" to these statements, which are designed to help him or her consider whether personal interests, abilities, and skills match those that are typically found among workers in the Interest Area.

FIGURE 2

CPS INTEREST AREAS AND OCCUPATIONS

1. Advising

Child care attendant
Employment counselor
Lawyer
Travel agent

2. Arranging

Architect
Florist
Hair stylist
Interior designer

3. Building and Making

Carpenter
Drafter
Painter
Roofer

4. Doing Clerical Work

Cashier
File clerk
Secretary
Stock clerk

5. Helping

Licensed practical nurse
Police officer
Properties manager
Waiter

6. Maintaining and Repairing

Appliance repairer
Mechanic
Plumber
Sanitation worker

7. Thinking in Pictures

Cartoonist
Commercial artist
Display artist
Photographer

8. Using Environmental Information

Farmer
Fish and game warden
Landscape gardener
Meteorologist

9. Working with Equipment

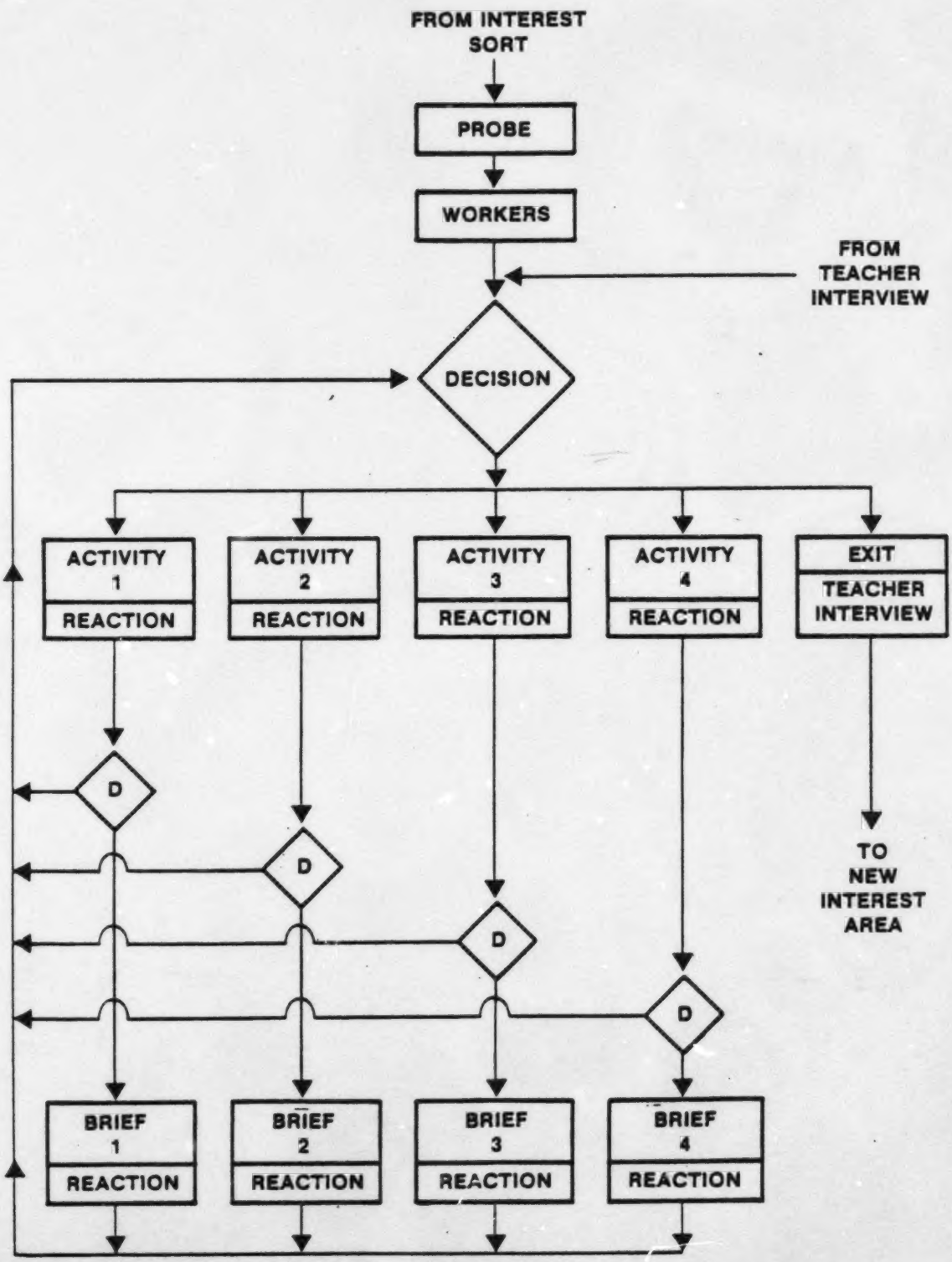
Computer service technician
Cook
Machinist
Telephone operator

10. Working with Numbers and Symbols

Library assistant
Market research coder
Medical laboratory assistant
Teller

FIGURE 3

INTEREST AREA FLOWCHART



Next, the student meets four imaginary workers representative of the occupations included in the Interest Area. These workers--for example, Jimmy Wolinski (painter), Cynthia Sakuma (architect), Clark Hampson (file clerk), Barbara MacIntosh (auto mechanic)--explain a little about their job tasks as simulated in the CPS Activities in order to enable the student to choose one or more of these Activities to explore.

The student next decides which of four Activities to complete as the first step in exploring a particular career. Across the CPS, the Activities cover a wide range of tasks: the visual problem identification of the landscape gardener, the computation of the waiter, the form completion of the employment counselor, and so on. Designed to give students a "feel" for the occupations they represent, the Activities are highly interactive and make sustained and persistent use of a variety of strategies (graphics, sound, joysticks, gamelike sequences, etc.) both for motivating students and for encouraging their active involvement with and deep cognitive processing of the information that is presented.

Each Activity takes approximately twenty to thirty minutes to complete, offers a list of additional activities (external to the CPS) that a student might try in order to expand his or her exploration of the occupation, and concludes with a Reaction Form designed to provide an opportunity for the student to record personal perceptions of the Activity. The computer stores the student's responses to the two questions on this Form--"How much did you like this Activity?" and "How well did you do in this Activity?"--and later uses these as well as other student responses

to compile an individualized list of up to ten CPS jobs that are of greatest interest to the student. The student is also instructed to fill out a complementary Reaction Form in the Student Guide that encourages him or her to expand upon the computerized responses and the reasons for them.

At this point the student encounters another decision--whether to read an occupational Brief about the job just explored in the Activity; to explore another Activity in the Interest Area; or to leave the Interest Area to go to another one or, if appropriate, to proceed to the Education Plan component of the CPS.

The CPS includes forty menu-driven occupational Briefs, one for each Activity. The Briefs follow a consistent format to provide sketches of the kinds of information the student should consider when making career choices--additional job tasks, the work environment, educational preparation, salary range, and so on.

To complete a Brief, the student "interviews" the worker whose comments earlier in the Interest Area first sent him or her to the occupational Activity: the student meets the worker again, reads a few displays in which the worker gives some basic information about the occupation, and then selects any four (or more) of six questions to "ask" the worker. The student may ask those questions in any order and is returned to the menu of questions after each answer for his or her next selection; a computerized counting routine keeps track of the questions the student asks in order to ensure that questions are not repeated and to allow

the student the option of skipping either one or two questions and continuing with the next section of the Brief.

The answers to five of the six questions are given in conversational, first-person narratives by the worker the student is interviewing. The answer to the sixth question--"How can I become a(n) (occupation title)?"--is a list of high-school courses to take, in- and out-of-school activities to pursue now, and things to do after high school to enter the occupation. The student is instructed to copy this information into the "Career Plan" section of the Student Guide for use in the culminating component of the CPS, the development of the Education Plan. Finally, the student completes a two-part Reaction Form: (1) a computerized part that stores answers to two questions--"Would you like to do the kind of work you learned about in the Brief?" and "Could you learn to do good work in this job?"--to use in compiling the list of student preferred jobs described earlier and (2) a complementary Student Guide part designed to help the student expand upon the reasons for his or her computerized responses.

A student can explore as much or as little of each Interest Area as he or she desires. As Figure 3 shows, a student can leave an Area after reading the Probe and meeting the workers, after completing any Activity, or after completing any Brief. Thus, a student can leave an Interest Area if none of the jobs seems appealing or can remain in it to complete one or more Activities and, if desired, their accompanying Briefs. Each time a student decides to leave an Interest Area, he or she is

directed to participate in an "Exit Interview" designed to assist the teacher in facilitating the student's experiences with the CPS. During this interview, the teacher is to help the student explore personal feelings about the Interest Area and, if he or she has left it after only minimal exposure, the reasons for that decision. Since it is important for the student to maintain control over the experience, the interview should be supportive rather than directive. If appropriate, the discussion might be based on the Reaction Forms completed by the student during work in the Interest Area.

Although the CPS is essentially an individualized, self-paced instructional package that focuses on growth in self-awareness rather than on interpersonal concerns, students should come to recognize that growth comes through interaction with others as well as through solitary reflection. To encourage this recognition, the Instructor Guide includes a number of suggestions for discussions, games, and other activities that the teacher and pairs or other small groups of students can use to enhance personal growth. These supplementary activities are related to career planning and decision-making in general and to topics related specifically to particular CPS Interest Areas. They are not mandatory but are to be used at the discretion of the teacher--for example, with students who have finished several Interest Areas and might profit from discussing their experiences with one another. The Instructor Guide also lists sources and references that teachers and counselors can use to provide additional occupational information to students who request it.

4. Education Plan

Developing plans for further examination of and preparation for occupations of interest is the culmination of the student's work with the Career Planning System. Once the student has completed all the CPS Activities and Briefs of interest, he or she--in conference with the teacher or counselor--designs a plan for further exploration that incorporates the self-knowledge gained from the CPS experience. The student begins this effort with a computerized component that presents some brief introductory information and then compiles the student's responses on all his or her computerized Reaction Forms into a ranked list of as many as ten CPS jobs in which the student indicated the greatest amount of interest. The student copies this list into the Student Guide and then takes the Guide to the teacher or counselor to serve as the basis for a joint planning session in which the student and the adult together develop a plan for the student to follow to learn more about each occupation of interest.

The two-person planning team follows a standard procedure to develop plans related to as many of the student's preferred occupations as seems appropriate. Starting with the job at the top of the list, the team reviews the relevant Reaction Forms and Career Plan pages contained in the Student Guide. This material, supplemented by the teacher's or counselor's knowledge of the student and the student's own increased self- and career knowledge, enables the team to answer the eight questions on the Education Plan pages in the Guide. These questions, which address such issues as the skills and training required for the occupation

and the traditional and nontraditional ways for acquiring these, are designed to focus the student's planning efforts and to provide initial suggestions for implementing early career-planning decisions.

Although the completion of the Education Plan component of the Career Planning System constitutes the completion of the CPS itself, the student's career exploration and planning efforts should obviously not terminate at this point. Once a student has completed one or more plans, he or she should select one (if necessary) and--with the teacher's or counselor's assistance as necessary and practical--begin to implement it. In addition, the student can repeat his or her work with the CPS one or more times--gaining something more from each experience as self- and career knowledge and sophistication in career planning increase.

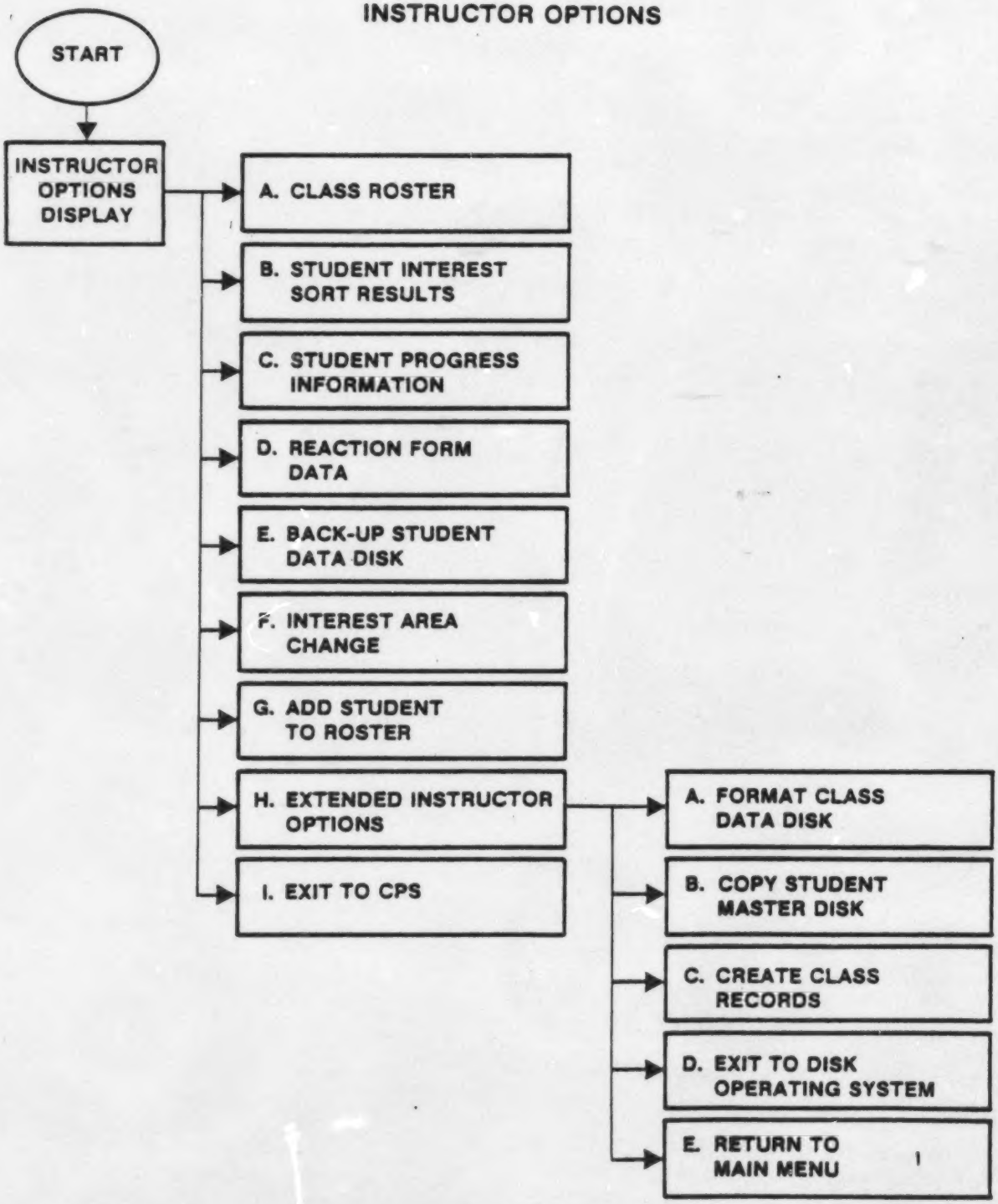
The Management System

Designed to simplify the teacher's task of monitoring and facilitating each student's progress through the Career Planning System, the CPS management component is a thorough and sophisticated mechanism that does all the student record keeping required by the CPS instructional component and offers a number of additional options as well. As displayed in Figure 4, "Instructor Options," the management system offers two menus of functions to be used in concert with the CPS.

To begin working with the System, the teacher chooses function H on the "main menu" to get to the "extended instructor options" menu--a list of functions the teacher uses only once to initiate work on the CPS and can then ignore for the remainder of the experience. Essentially, these functions enable the teacher to

FIGURE 4

INSTRUCTOR OPTIONS


START
INSTRUCTOR OPTIONS DISPLAY
A. CLASS ROSTER
B. STUDENT INTEREST SORT RESULTS
C. STUDENT PROGRESS INFORMATION
D. REACTION FORM DATA
E. BACK-UP STUDENT DATA DISK
F. INTEREST AREA CHANGE
G. ADD STUDENT TO ROSTER
H. EXTENDED INSTRUCTOR OPTIONS
I. EXIT TO CPS
A. FORMAT CLASS DATA DISK
B. COPY STUDENT MASTER DISK
C. CREATE CLASS RECORDS
D. EXIT TO DISK OPERATING SYSTEM
E. RETURN TO MAIN MENU

prepare disks to accept and store the data that both determine each student's progress through the CPS and allow the teacher to track that progress. By following carefully detailed instructions that appear in the Instructor Guide and on individual computer displays, the teacher uses these options (1) to create the computer files that will store the students' individualized records and (2) to format and copy back-up disks as insurance in case the original record disks are lost or destroyed. Each record disk can hold complete files for up to twelve students, and the teacher establishes these files simply by typing each student's first and last names and a three-digit number between 100 and 998. This number becomes the student's CPS code number--the number that the computer uses to store the student's records and route him or her automatically through the CPS and that the teacher uses to gain access to the student's stored records. These records are protected from unauthorized access by the use of a special instructor code word that must be entered on the computer to activate the management system.

The seven instructor options on the main menu (i.e., all but the two included to provide access to the "extended options" menu and to the instructional component itself) comprise the set of functions the teacher will use throughout the students' CPS experience. The first of these--"Class Roster"--results from the creation of the class records and provides a list of the first and last names and (as a reference for the teacher) of the CPS code numbers of all the students working on the CPS. The second option--"Student Interest Sort Results"--enables the

teacher to see, on a student-by-student basis, the student's name, the Interest Area in which he or she is currently working, and the list of all his or her identified Interest Areas in order of preference as computed during the Interest Sort. The third option--"Student Progress Information"--shows the linear progress of any student through the CPS by listing, in order as completed, all the Probes, Activities, and Briefs the student has finished. The fourth option--"Reaction Form Data"--provides a summary of any student's answers to the questions on the computerized Reaction Forms for all the Activities and Briefs explored.

The final three options on this menu are concerned more with instructional management than with tracking student progress. "Back-up Student Data Disk," for example, should be used at the end of each day's work in order to keep a current back-up record of students' progress in case the original record becomes unavailable. "Interest Area Change"--a function that allows the teacher to interrupt the normal flow of the CPS when he or she determines that such an interruption is in the best interests of a student--enables the student either to explore an Interest Area that was not indicated by his or her original Interest Sort or to return to an Interest Area that he or she had previously completed. And "Add Student to Roster" allows the teacher to create computer files on an existing record disk for any students who begin their work on the CPS after the roster for the rest of the class has been created.

Conclusion

Taken together, the instructional and management components of the Career Planning System, Microcomputer Version, provide a comprehensive, well-integrated, thoroughly documented, and thoroughly tested instructional package for learning disabled, mildly mentally retarded, and severely behaviorally handicapped middle-school students. Designed to capitalize on the motivational and managerial capabilities of one of the most exciting and powerful innovations in the history of instructional technology, this courseware package holds special progress for helping exceptional students make sound, well-informed career decisions that will ease their transition from school to jobs and, ultimately, enable them to achieve their right to full participation in the American work force.

For further information, please contact

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